Claims

1. Device (1) for the detection of at least one luminescent substance (2), with a radiation source (3) for the emission of excitation radiation (4) on the at least one luminescent substance (2), whereby the excitation radiation (4) has at least one excitation wavelength at which the luminescent substance (2) is excited to emit luminescent radiation (5), and with at least one radiation receiver (9, 9', 9") which is insensitive to the excitation radiation (4), for the detection of the luminescent radiation (5), **characterized by the fact** that the luminescent substance (2) is located in the interior or a measurement chamber (7) which is transparent to the excitation radiation (4) and is essentially impermeable to radiation to which the radiation receivers (9, 9, 9) are sensitive, and that the radiation source (3) is located outside the measurement chamber (7) such that the excitation radiation (4) is injected through the measurement chamber (7) into the interior of the measurement chamber (7).

2. Device (1) as recited in Claim 1, characterized by the fact that a wall area of the measurement chamber (7) that faces the radiation source (3) and is transparent to the excitation radiation (4) is formed by a semiconductor substrate, and that the at least one radiation receiver (9, 9', 9") is integrated in the form of a semiconductor assembly into the semiconductor substrate.

3. Device (1) as recited in Claims 1 or 2, characterized by the fact that the luminescent substance (2) is realized so that the wavelength of the luminescent radiation (5) is less than the excitation wavelength.

4. Device (1) as recited in Claim 3, characterized by the fact that the semiconductor substrate (8) is a silicon substrate.

5. Device (1) as recited in one of the Claims 1 to 4, characterized by the fact that it is realized in the form of a thermal imaging camera that has a plurality of radiation receivers (9, 9', 9") located in the measurement chamber (7) in the form of a two-

dimensional matrix, with at least one associated optical imaging system for the imaging of the radiation source (3) on the radiation receivers (9, 9', 9").

6. Device (1) as recited in one of the Claims 1 to 5, characterized by the fact that a boundary wall (12) of the measurement chamber (7) facing the wall area is realized in the form of a reflector for the reflection of the excitation radiation (4).

7. Device (1) as recited in one of the Claims 1 to 6, characterized by the fact that the transparent wall area is connected by means of an optical waveguide (13) with the interior (6) of the measurement chamber (7), and that the waveguide (13) runs preferably parallel to the plane of extension of the transparent wall area, in particular to its inside facing the luminescent substance (2).

8. Device (1) as recited in one of the Claims 1 to 7, characterized by the fact that a measurement signal output of at least one radiation receiver (9, 9', 9") is connected with a transponder for the transmission of the measurement signal or of a signal derived from it to a receiver part, and that the transponder is preferably integrated into the semiconductor substrate (8).

9. Device (1) as recited in one of the Claims 1 to 8, characterized by the fact that in the interior (6) of the measurement chamber (7) there are at least two luminescent substances (2) with excitation wavelengths that are different from each other, and that associated with each of these luminescent substances (2) there are radiation sources (3) with a spectral distribution adapted to the excitation wavelength of the respective luminescent substance (2).

10. Device (1) are recited in one of the Claims 1 to 9, characterized by the fact that the measurement chamber (7) is realized in the form of a flow-through measurement chamber with an interior cavity (6), at least one inlet opening (15) and at least one outlet opening (16).

11. Device (1) as recited in one of the Claims 1 to 10, characterized by the fact that in the interior cavity (6), on the surface of at least one radiation receiver (9, 9', 9"), at least

one receptor (17, 17', 17") for a ligand, in particular for a biomolecule, a biological cell and/or at least one fragment of such a ligand, biomolecule or cell is immobilized, and that the ligand is marked with the at least one luminescent substance (2).

12. Device (1) as recited in one of the Claims 3 to 11, characterized by the fact that a plurality of radiation receivers (9, 9', 9") are located next to one another, preferably in the form of a two-dimensional array, on the semiconductor substrate (8), and that different receptors (17, 17', 17") are optionally located on the radiation receivers (9, 9', 9").

13. Device (1) as recited in Claims 10 or 12, characterized by the fact that at least two of the different receptors (17, 17', 17") have a different affinity for at least one ligand marked with the luminescent substance (2), and that optionally more than two receptors (17, 17', 17" are provided that have a graduated affinity for the at least one ligand.

14. Method for the detection of at least one luminescent substance (2), whereby the luminescent substance (2) is irradiated with an excitation radiation (4) that has at least one excitation wavelength at which the luminescent substance (2) is excited to the emission of luminescent radiation (5), and whereby the luminescent radiation (5) emitted by the luminescent substance (2) is detected by at least one radiation receiver (9, 9', 9") which is insensitive to the excitation radiation (4), **characterized by the fact** that the luminescent substance (2) is located in the interior of a measurement chamber (7) that is transparent for the excitation radiation (4) and is essentially impermeable to radiation to which the radiation receiver (9, 9', 9") is sensitive, and that the luminescent substance (2) is irradiated with the excitation radiation (4) through the measurement chamber (7).